

**Project Title:**

Strip Tilling Vegetables to Boost
Organic Matter, Farmland
Conservation and Grower Productivity

Grant Recipient:

Appalachian Sustainable Development

Other Key Project Partners:

Virginia Cooperative Extension

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Conservation Innovation Grant (CIG) Fact Sheet

Benefits of Strip Tillage

Strip tillage creates a narrow band of “tilled” soil, while leaving the remainder of the field undisturbed. This undisturbed soil reduces soil erosion, increases pore space development through the soil profile and generally increases the overall “soil health”. Strip tillage creates a tilled zone of soil conducive to good soil to seed contact, promoting quick and uniform germination.

This small zone of worked soil also provides an area for roots to grow with little resistance. This can be very important in some of the vegetable crops that have less aggressive root systems. This suitable soil situation is accomplished while maintaining cover on a large percentage of the land area, thus reducing erosion and building soil health.

Machinery for Strip Tillage

Strip tillage can be conducted in various ways. The most common is the use of “one-pass” units from companies like Unverferth Manufacturing Co., Inc. or Kelly Manufacturing Co. (KMC). These units usually consist of a coulter, a sub-soiler shank, two offset coulters and a rolling basket (also known as a crumbler). In friable soils, these units make an excellent seedbed about 8 to 12 inches wide with one pass through the field.

The downside to these units is that they are quite heavy and quite expensive. These units require from 35 to 50 HP per row to operate. Therefore, a two row unit requires a 75 to 100 HP tractor to operate properly. A two-row unit sells for approximately \$10,000 and a four-row unit can cost from \$15,000 to \$20,000.

Other strip tillage options have included multiple passes with a sub-soiler. Growers have been known to remove tines from tractor mounted rototillers and work strips. Of these systems, a sub-soiler shank followed by a rototiller is likely the best option. This can be done with smaller equipment, but may take 3 to 5 passes to optimize the strip tilled region.

Vegetable Crops that Work with Strip Tillage

Strip tillage is recommended for cucurbit crops like pumpkins, squash and gourds. Multiple trials with these crops have shown very positive results compared to no-till (NT) and conventionally tilled (CT) plots. This practice

would likely have merit in summer squash (yellow and zucchini) and bare ground cucumber production.

Strip tillage is a possibility in brassica crops like cabbage, broccoli, cauliflower, collards, kale, etc. However, the standard production system of the Blue Ridge Plateau Region of Southwest Virginia is now a three row narrow system. In this system, almost complete tillage of the soil area is required for the equipment to operate properly. However, in an alternative 36" to 42" row spacing, strip tillage could have potential for these crops.

Plasticulture production has become the accepted production system in tomatoes, peppers and many other crops. Side-by-side trials comparing strip tillage to the plasticulture production system have not been as positive as with other crops. In some situations with tomatoes, it was like going back in time. The strip tillage system resulted in increased disease pressure, more cull fruit and less marketable yield. Therefore, strip tillage would not be recommended for tomatoes and peppers on a commercial scale.

However, small producers might be able to utilize strip tillage. This is especially true if they are willing to mulch the area with straw to prevent soil splashing onto the fruit and lower leaves.

IMPORTANT: Even with drip irrigation, more water will be required for strip tillage as compared to plasticulture production.

This is a result of two factors. The first is the lack of plastic mulch to limit evaporation from the soil surface. The second factor is the opening of a deep channel into the soil profile with the sub-soiler shank. The water tends to migrate down this channel and not stay in the root zone. Therefore, more total water and more frequent watering is required.

Strip tillage could also have potential in crops like sweet corn and green beans. It is recommended that growers start with small acreages and perfect the system for their specific practices.



Pumpkin Plant in No-till (28 days after planting)



Pumpkin Plant in Strip Tillage (28 days after planting)